REMARKS

Applicants and counsel thank the Examiner for the personal interview granted on October 24, 2002. The subject response is intended to narrow the remaining issues and address points discussed at the interview. Entry of this amendment under Rule 116 is therefore requested. Accompanying this amendment is a submission entitled "DECLARATION OF ALLAN SAILLAND (RULE 132)". The indicated allowability of certain of the pending claims is acknowledged with appreciation.

Claims 42, 46, 47, 50, 53 and 54 are amended to make the corrections pointed out on page 2 of the Official Action. Claim 54 is amended to specify a plant transformed with the nucleic acid of the invention, with the understanding that any progeny of a first generation transgenic plant would be considered by persons in the art to be a transformed plant.

Applicants respectfully traverse the rejection based on alleged lack of written description. In the final rejection, the Examiner noted that no description of EPSPS consensus sequences was provided in the application. Official Action, page 4. Applicants submit that the knowledge of EPSPS sequence homology was so developed by the time of filing that such disclosure should be considered unnecessary. The inventors were aware of this sequence similarity and considered their work with maize EPSPS to be representative. Sailland Declaration, paragraphs 3 and 4.

Note also that the earlier-filed Einholz patent referenced in the Sailland Declaration, U.S. 5,310,667, also relates to EPSPS modifications (different than those claimed here) and teaches

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applicability to various EPSPS sequences, and the teaching is not limited to the work in the examples with maize and petunia. See, e.g. Col. 3, lines 40-46. This further evidences that, prior to applicants' filing date, those in the art considered EPSPS genes from various sources to be essentially the same.

The Examiner also comments that "it does not appear that Applicant contemplated the claimed invention as limited to plant EPSPS enzyme encoding nucleic acids, and excluding other EPSPS nucleic acids." Office Action, page 4. While it is correct that the disclosure and claims as filed suggested the use of EPSPS genes of any source (See Sailland Declaration, paragraph 4), the claims as filed with the application included original claim 7, drawn specifically to plant-derived EPSPS, thus evidencing possession of plant EPSPS modifications as a discrete embodiment of the invention.

For all of these reasons, it is requested that the rejection for lack of written description be withdraw.

Claims 42, 45, 46 and 50-53 remain rejected as lacking enablement support. This rejection is respectfully traversed. There appears to be no disagreement on the record that the applicable level of skill was high, and that the techniques needed to prepare and screen mutated EPSPS sequences, and to prepare transformed plants, were well-known.

Applicants again note that the strong sequence conservation of the relevant region of EPSPS enzymes leads to relative predictability that the same Thr102Ile and Pro106Ser mutations will be effective in organisms other than maize. This is evidenced by the work in Applicants'

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laboratory with the bacterial AroA gene. Sailland Declaration, paragraph 5. Predictability is further evidenced by the work of others with rice, following the teaching of Applicants' published disclosure of the Thr102Ile and Pro106Ser mutations, to generate glyphosate-tolerant rice EPSPS and transgenic rice plants. See, "Declaration of Richard T. DeRose, Ph.D."(of record), paragraph 24, citing WO 00/66746.

Both the Einholz patent and the Kishore WO document cited in the Sailland Declaration are powerful evidence that a person of ordinary skill as of applicants' filing date would have been enabled to practice the present invention using plant EPSPS enzymes other than EPSPS derived from maize. The later work reported in rice serves to confirm what would have been expected.

Given the art-recognized similarity of the EPSPS enzymes (particularly in plants), and the fact that the present claims are narrowly-drawn to specific mutations rendering the plant-derived EPSPS nucleic acids to encode glyphosate-tolerant enzymes, it is urged that the present claims are commensurate with the enablement provided by the disclosure.

Based on the foregoing, reconsideration of the rejections and allowance of claims 42-54 is requested.

The fee for a one month extension of time is enclosed. If any further fee is due, or refund

due, please charge or credit the account of the undersigned attorneys, Account No. 03-2775.

Respectfully submitted,

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Encl: DECLARATION OF ALLAN SAILLAND (RULE 132)
EXTENSION OF TIME REQUEST (w/fee)

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MARKED-UP VERSION OF AMENDED CLAIMS

42. (Twice Amended) A modified nucleic acid molecule of plant origin encoding an EPSPS enzyme, the modifications comprising:

a first modification of a coding sequence that normally encodes a threonine that is located, relative to the gene from which it is derived, at position 102 of the amino acid sequence of the mature EPSPS sequence of SEQ ID NO: 3, to encode isoleucine in a mature plant EPSPS sequence; and

a second modification of a coding sequence that normally encodes a proline that is located, relative to the gene from which it is derived, at position 106 of the amino acid sequence of the mature EPSPS sequence of SEQ ID NO: 3, to encode serine in a mature plant EPSPS sequence.

46 (Twice Amended). The vector of claim 45 further comprising a nucleic acid encoding a chloroplast transit peptide operably associated with, and in the order of transcription between, the promoter functional in a plant cell and the nucleic acid of claim 42.

47 (Twice Amended). A plant cell comprising a vector comprising the following components, which are operably associated in the direction of transcription:

(a) a promoter functional in a plant cell;

(b) nucleic acid encoding a chloroplast transit peptide;

(c) a modified nucleic acid molecule of maize origin encoding an EPSPS enzyme, the modifications comprising:

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a first modification of a coding sequence that normally encodes a threonine that is located, relative to the gene from which it is derived, at position 102 of the amino acid sequence of the mature EPSPS sequence of SEQ ID NO: 3, to encode isoleucine in a mature plant EPSPS sequence; and

a second modification of a coding sequence that normally encodes a proline that is located, relative to the gene from which it is derived, at position 106 of the amino acid sequence of the mature EPSPS sequence of SEQ ID NO: 3, to encode serine in a mature plant EPSPS sequence; and

(d) an untranslated transcription termination signal region.

50 (Twice Amended). A transgenic plant comprising a vector comprising the following components, which are operably associated in the direction of transcription:

(a) a promoter functional in a plant cell;

(b) nucleic acid encoding a chloroplast transit peptide;

(c) a modified nucleic acid molecule of plant origin encoding an EPSPS enzyme, the modifications comprising:

a first modification of a coding sequence that normally encodes a threonine that is located, relative to the gene from which it is derived, at position 102 of the amino acid sequence of the mature EPSPS sequence of SEQ ID NO: 3, to encode isoleucine in a mature plant EPSPS sequence; and

a second modification of a coding sequence that normally encodes a proline that is

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located, relative to the gene from which it is derived, at position 106 of the amino acid sequence of the mature EPSPS sequence of SEQ ID NO: 3, to encode serine in a mature plant EPSPS sequence; and

(d) an untranslated transcription termination signal region.

53 (Twice Amended). A method for selectively controlling plants which method comprises the steps of:

a) planting crop seeds or plants which have increased glyphosate tolerance as a result of a chimeric gene being inserted into said crop seed or plant, said chimeric gene having

(i) a promoter region functional in a plant cell; and

(ii) a nucleic acid molecule of plant origin encoding a modified EPSPS enzyme, the modifications comprising:

a first modification of a coding sequence that normally encodes a threonine that is located, relative to the gene from which it is derived, at position 102 of the amino acid sequence of the mature

EPSPS sequence of SEQ ID NO: 3, to encode isoleucine in a mature plant EPSPS sequence; and

a second modification of a coding sequence that normally encodes a proline that is located, relative to the gene from which it is derived, at position 106 of the amino acid sequence of the mature EPSPS sequence of SEQ ID NO: 3, to encode serine in a mature plant EPSPS sequence; and

(iii) an untranslated transcription termination signal region; and

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b) applying to said plants a sufficient amount of glyphosate to control said untransformed plants without significantly affecting said plants that comprise the chimeric gene.

54. (Amended) A plant [comprising] transformed with a nucleic acid encoding a mature EPSPS protein of plant origin having isoleucine substituted for the threonine that is relatively located at position 102 of the amino acid sequence of mature EPSPS sequence of SEQ ID NO: 3; and

serine substituted for the proline that is relatively located at position 106 of the amino acid sequence of mature EPSPS sequence of SEQ ID NO: 3.

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